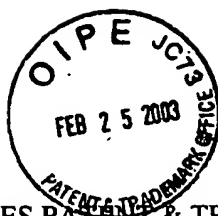


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193176US-2

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

SATORU FURUTA

SERIAL NO. : 09/599,367

FILED: JUNE 21, 2000

FOR: NOISE SUPPRESSION
APPARATUS

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: GROUP ART UNIT: 2745

:

RECEIVED
FEB 26 2003
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PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified application as follows:

IN THE SPECIFICATION

Please amend the specification as indicated below.¹

$$\alpha_a = \begin{cases} \alpha_{MAX} & ; snr_{all} \geq SNR_h \\ \{(\alpha_{MAX} - \alpha_{MIN})snr_{all} + (SNR_h \alpha_{MIN} + SNR_l \alpha_{MAX})\} / (SNR_h - SNR_l) & ; SNR_h > snr_{all} \geq SNR_l \\ \alpha_{MIN} & ; SNR_l > snr_{all} \end{cases} \quad (5)$$

MLB 9/25/00

Page 15, please amend the equation at line 21 as follows:

¹A marked-up copy of the amendments is attached hereto.

MLB 9/25/06

12

Page 16, please amend the equation at line ¹²10 as follows:

A2

$$L_p(dB) = \begin{cases} P_n & dP_s < 0 \\ P_n - dP & dP_s > 0 \text{ and } P_n - dP_s > 0 \\ 0 & P_n - dP_s < 0 \end{cases} \dots (7)$$

MLB 9/25/06

13 23

Page 16, paragraph at lines ¹³11 to ²³20, please amend as follows:

A3

The correction gain calculation unit 6 calculates the noise amplitude spectrum correction gain $\alpha [f]$ and the noise removal spectrum correction gain $\beta [f]$, on the basis of the input amplitude spectrum $S [f]$, noise amplitude spectrum $N [f]$, noise amplitude spectrum correction gain limiting value L_a , and the noise removal spectrum correction gain limiting value L_p . Using $\alpha [f]$, the noise amplitude spectrum $N [f]$ can be corrected for each frequency component. And using the noise removal spectrum correction gain $\beta [f]$, the after-mentioned first noise removal spectrum $S_s [t]$ is corrected for each frequency component.

5 12

Page 18, paragraph at lines ⁵8 to ¹²9, please amend as follows:

MLB 9/25/06

The value of the phone reception weighting value $W_a [f]$ is predetermined according to its parameter, frequency f . And the value of $W_a [f]$ decreases as the frequency increases. As a result of this weighting, the value of $\alpha [f]$ decreases in the high frequency region. Consequently an excessive suppression in the high frequency region can be avoided so that a generation of a strange sound in the frequency region can be avoided. Fig. 11 shows a profile of the $W_a [f]$.

MLB 9/25/06

21

Page 18, paragraph beginning at line ²¹18, to page 19, line 6, please amend as follows:

A4

According to equation (10), when the value $\text{snr}_{sp} [f]$ increases, namely when the SNR increases, the value of gain_p increases, therefore, the noise removal spectrum correction gain

$\beta[f]$ increases, correspondingly. Consequently, when a spectrum component has a large SNR, the amplitude of the noise removal spectrum, the output of the after-mentioned spectrum suppression unit 8, increases. On the other hand, when a spectrum component has a large SNR, the amplitude of the noise removal spectrum, the output of the after-mentioned spectrum suppression unit 8, increases. On the other hand, when a spectrum component has a small SNR, the amplitude of the output is small. Fig. 10 shows a profile of $\beta[f]$ with respect to the value of $\text{snr}_{\text{snr}}[f]$.

MLB 9/25/06

Page 20, please amend the equation at line 7 as follows:

A5

$$\beta_s[f] = \begin{cases} S[f] - \alpha[f] \cdot N[f] & \text{if } S[f] - \alpha[f] \cdot N[f] > 0 \\ 0 & \text{or } n[f] \quad \text{else} \end{cases} \dots (11)$$

IN THE CLAIMS

Please add new Claims 10 and 11 as follows:

A6

10. A noise suppression apparatus, comprising:

a unit for determining noise amplitude spectrum of an input signal from noise-likeness of the input signal, the input signal including a noise component;

a unit for calculating a noise amplitude spectrum gain based on an input amplitude spectrum of the input signal and the noise amplitude spectrum, correcting the noise amplitude spectrum gain with a predetermined first coefficient to obtain a noise amplitude spectrum correction gain, and calculating a noise removed spectrum gain based on the input amplitude spectrum of the input signal and the noise amplitude spectrum;

a unit for performing, with respect to the input amplitude spectrum of the input signal, spectrum subtraction based on the noise amplitude spectrum correction gain and